



## MIXED BAG

## Malaria and HIV: A deadly combination

Malaria and HIV are both endemic in many parts of the world, and South Africa is one of them. Effects of HIV infection on malaria infection and illness have been seen in HIV-positive pregnant women and in HIV-positive adults. HIV-positive people are more likely to have symptoms of malaria and to have higher parasite densities than those without HIV.

However, the authors of this interesting paper in the *Lancet* point out that the effects of malaria on HIV infection itself have not been well characterised, and initial reports have shown no convincing evidence of any interaction.

These investigators set out to examine the effects of *Plasmodium falciparum* malaria on concentrations of HIV in blood using a prospective study in and around an agricultural estate in Thyolo District, Malawi. They carried out the study from February to November 2002. Using a prospective cohort design, they assessed the effect of malaria on concentration of HIV-1 RNA in the blood over 3 time points: An enrolment visit when the person was aparasitaemic, during an episode of malaria and again at a visit about 8 weeks after the malaria visit at which the person was aparasitaemic and had had no intervening episodes of parasitaemia. Enrolment began in October, before the malaria season, and follow-up continued through the malaria season. They recruited 367 HIV-1 infected

adults. Among 334 people who were aparasitaemic at baseline, 148 had at least one malaria episode during follow-up and received antimalarial treatment. Of these, 77 had HIV-1-RNA measurements at baseline, during malaria and post-malaria. The authors used statistical techniques to differentiate and assess the effects of 4 different types of malaria: Any parasitaemia, parasite density at least 2 000/ $\mu$ l, febrile parasitaemia and febrile parasitaemia with parasite density at least 2 000/ $\mu$ l. The effects of these 4 types of malaria were assessed on changes in log HIV-1-RNA, overall and by baseline CD4 count.

What they found was crucial to an understanding of the interaction between malaria and HIV. With malaria defined as any parasitaemia, HIV-1-RNA concentration almost doubled between baseline and malaria. However, by about 8 - 9 weeks post-malaria, the HIV-1-RNA concentration had fallen significantly. Increases in HIV-1 RNA were greatest in people with fever, parasite density 2 000/ $\mu$ l or greater and a CD4 count of more than 300 cells/ $\mu$ l. People who remained aparasitaemic showed no changes in HIV-1-RNA concentration.

These findings show that concentration of HIV-1 RNA in the blood increases significantly with malaria. Increases in HIV-1 RNA coincide with malaria even in the absence of any other systemic febrile illness that could contribute to increases in viral load. The findings, as the authors point out, have important implications regarding transmission and possible progression of HIV disease in areas where the two infections

are co-endemic. The way that this study was designed allowed the investigators to show a clear relationship between an increase in viral load with malaria because they had baseline measurements without malaria. What is also highly significant is that this increase is reversible with prompt and effective treatment for malaria, although the authors also point out that, even with treatment, the increase in viral loads might be sustained for long enough to increase the risk of HIV transmission, and possibly to accelerate disease progression in some people. This would be particularly true over the course of repeated malaria infections. One of many reasons for the nature of the pandemic in southern Africa perhaps?

Kublin J, *et al. Lancet* 2005; **365**: 233-240.